AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of <u>sharing a</u> signaling bearer connection on <u>an</u> Iu interface for <u>a Multimedia Broadcast Multicast Service (MBMS)</u> ~~service~~, ~~wherein~~ <u>a</u> <u>Radio Network Controller (RNC)</u> establishes ~~the~~<u>a</u> shared signaling bearer for MBMS service on <u>the</u> Iu interface, comprising ~~the steps of~~:

(a) <u>receiving, by the RNC,</u> ~~receives~~ <u>a-an</u> MBMS Notification message for ~~a certain~~<u>an</u> MBMS service<u>,</u> from <u>a Service General Packet Radio Service (GPRS) Supporting Node</u> <u>(SGSN)</u>;

(b) <u>constructing, by the RNC,</u> ~~constructs~~ <u>a-an</u> ~~MBMS Service~~<u>Signaling Connection</u> <u>Control Part (SCCP) Connection</u> Request message according to the contents of the notification <u>message</u>;

(c) <u>sending, by the RNC,</u> ~~sends~~ <u>a</u><u>the</u> ~~Signaling Connection Control Part~~ (SCCP) Connection Request message to <u>the</u> SGSN, ~~requests~~<u>to</u> <u>request</u> ~~establish~~<u>establishment of</u> ~~a~~<u>an</u> SCCP signaling connection~~, and then waits for a reply~~; <u>and</u>

(d) <u>receiving, by the RNC,</u> ~~receives~~ <u>a</u><u>an</u> SCCP Connection Confirmation message from the SGSN, <u>which indicates that a shared Iu signaling connection has been successfully</u> <u>established for the MBMS service</u>~~which indicates the success of the Iu signaling~~ ~~connection establishment used for this service~~.

2. The method as claimed in Claim 1, wherein ~~the following situation is added to~~ ~~the conditions of the existing SCCP connection establishment initiated by RNC:~~<u>step (c)</u> <u>further comprises sending,</u> ~~when~~<u>by the RNC,</u> ~~sends a~~<u>the</u> MBMS Service Request message, <u>and</u> if there is no corresponding Iu signaling connection for ~~this~~<u>the</u> MBMS service, <u>initiating, by the RNC,</u> ~~initiates~~ <u>a</u><u>an</u> SCCP connection establishment procedure.

3. The method as claimed in Claim 1, wherein ~~further comprising: if~~<u>when</u> a ~~certain~~UE <u>has relocated or</u> needs to receive ~~other~~<u>a</u> non-MBMS service ~~besides MBMS~~ ~~service or it has moved~~, <u>the</u> RNC ~~needs to establish~~<u>establishes</u> a dedicated Iu <u>signaling</u> connection for the UE~~, which~~ <u>by</u> ~~includes~~<u>performing</u> the following steps:

(a) <u>executing</u> ~~SRNC decides to execute~~<u>a</u> relocation procedure;

(b) constructing~~SRNC constructs~~ a Relocation Demand message and ~~checks~~ checking whether there is ~~a~~ an Iu signaling connection for this UE~~;~~, and if ~~it is absent~~ there is no Iu signaling connection for the UE, constructing ~~a~~ an SCCP Connection Request message which includes a Relocation Demand message in its data field ~~is constructed~~;

(c) sending ~~SRNC sends a~~ an SCCP Connection Request message to the SGSN, ~~requests~~ requesting to establish ~~a~~ an SCCP signaling connection, and then ~~waits~~ waiting for a reply; and

(d) receiving ~~SRNC receives~~ ~~a~~ an SCCP Connection Confirmation message from the SGSN, which indicates that the shared Iu signaling connection has been successfully established for the MBMS service ~~which indicates the success of the Iu signaling connection establishment used for this service~~.

4. The method as claimed in Claim 1, wherein ~~further comprising: if~~ when a ~~certain~~ UE has relocated or needs to receive ~~other~~ a non-MBMS service ~~besides MBMS service or it has moved~~, the SGSN ~~needs to establish~~ establishes a dedicated Iu signaling connection for the UE~~, which includes~~ by performing the following steps:

(a) after receiving ~~a~~ the SCCP Connection Request message from the RNC, separating~~SGSN separates the~~ a Radio Access Network Application Part (RANAP) message included in the data fields from the SCCP Connection Request message, and if the RANAP message is a Relocation Demand message, ~~it saves~~ saving the Iu signaling connection ID allocated by the RNC for this UE, ~~allocates~~ allocating ~~the~~ an identifier of the signaling connection in the SGSN, and ~~constructs~~ constructing the ~~[[a]]~~ SCCP Connection Confirmation message;

(b) ~~SGSN sends~~ sending ~~a~~ the SCCP Connection Confirmation message to the RNC;

(c) sending~~SGSN sends~~ a Relocation Request message to ~~the~~ a new SGSN; and

(d) sending, after receiving a Relocation Response message from the new SGSN, ~~the SGSN sends~~ a Relocation Command message to the RNC via the dedicated Iu signaling connection for the UE.

5. The method as claimed in Claim 1, wherein ~~further comprising: if~~ when a ~~certain~~ UE has relocated or needs to receive ~~other~~ a non-MBMS service ~~besides MBMS~~

~~service or it has moved~~, the RNC ~~needs to establish~~ establishes a dedicated Iu signaling connection for the UE, ~~which includes~~ by performing the following steps:

~~(a)~~ when the RNC receives a non Media Access Control (non-MAC) ~~message~~ Service Request message from a UE, ~~it examines~~ examining whether there is a dedicated Iu signaling connection for the UE, and if ~~it is absent~~ there is no dedicated Iu signaling connection for the UE, constructing ~~a~~ an SCCP Connection Request message ~~is constructed~~ and ~~a~~ initiating the SCCP connection establishment procedure ~~is initiated~~ while forwarding the Service Request message to the SGSN, wherein the RNC sends the SCCP Connection Request message to the SGSN ~~and then waits for a reply;~~,

~~(b) if~~ wherein the dedicated Iu signaling connection for the UE has been successfully established when the RNC receives ~~a~~ an SCCP Connection Confirmation message from the SGSN~~, it indicates that the dedicated Iu signaling connection for this UE has been successfully established~~.

6. The method as claimed in Claim 1, wherein ~~further comprising: if~~ when a ~~certain~~ UE has relocated or needs to receive ~~other~~ a non-MBMS service ~~besides MBMS service or it has moved~~, the SGSN ~~needs to establish~~ establishes a dedicated Iu signaling connection for the UE, ~~which includes~~ by performing the following steps:

(a) after receiving ~~a~~ an SCCP Connection Request message from the RNC, ~~SGSN separates~~ separating ~~the~~ a Radio Access Network Application Part (RANAP) ~~RANAP~~ message included in the data fields from the SCCP Connection Request message, and if the RANAP message is a Service Request message, ~~it saves~~ saving ~~the~~ an Iu signaling connection ~~identifier~~ identifier ~~ID~~ allocated by the RNC for this UE, ~~allocates~~ allocating the identifier of the signaling connection in the SGSN, and ~~constructs~~ constructing ~~a~~ the SCCP Connection Confirmation message;

(b) ~~SGSN sends~~ sending ~~a~~ the SCCP Connection Confirmation message to the RNC; and

(c) if the service request is accepted, ~~the SGSN returns back~~ returning a Service Acceptance message to ~~MS~~ the UE and ~~sends~~ sending ~~a~~ an Establish Radio Access Bearer (RAB) message via this dedicated Iu signaling connection.

7. The method as claimed in Claim ~~1~~3, wherein ~~further comprising: in the SRNS relocation flow, if the~~ a target RNC is not incorporated with ~~a certain~~an MBMS service necessary for the UE after the UE ~~receiving~~receives a Relocation Request message, ~~it~~the target RNC sends ~~a~~an MBMS Service Request message to the SGSN, ~~thus, During the next step (607, 707, 807), RAB establishment procedure can also~~to establish an RAB for the MBMS service.

8. The method as claimed in Claim 1, wherein the RNC initiates an Iu connection release procedure for the shared MBMS Iu signaling connection, when there is no UE using a certain MBMS service between the RNC and the SGSN~~, RNC can initiate a Iu connection release procedure~~.

9. The method as claimed in Claim 1, wherein the SGSN initiates a release procedure for the shared MBMS Iu signaling connection, ~~SGSN can initiate a release procedure in the following two situations:~~
—when the SGSN ~~won't~~no longer ~~receive~~receives MBMS data ~~any more, a signaling connection and RAB release procedure can be initiated;~~, and
— when ~~no UE uses a certain~~an MBMS service between the RNC and the SGSN~~, SGSN can initiate a Iu connection release procedure~~ is not used by a UE.

10. A method of sharing a signaling bearer connection on an Iu interface for a Multimedia Broadcast Multicast Service (MBMS)~~ service~~, ~~wherein~~ a Service General Packet Radio Service (GPRS) Supporting Node (SGSN)~~SGSN~~ establishes ~~the~~a shared signaling bearer for the MBMS service, the method ~~includes the following steps~~comprising:
(a) sending, by the SGSN,~~ sends a~~ an MBMS Notification message to a Radio Network Controller (RNC) after receiving ~~the~~data sent from a Gateway General Packet Radio Service (GPRS) Supporting Node (GGSN)~~GGSN~~, ~~notifies~~notifying of relevant MBMS service information, and then ~~waits~~waiting for ~~the~~a response message from the RNC;
(b) after receiving a Signaling Connection Control Part (SCCP)~~a SCCP~~ Connection Request message from the RNC, separating, by the SGSN,~~ separates~~ a Radio Access

Network Application Part (RANAP) the RANAP message included in the data fields from the SCCP Connection Request message and saves saving the an Iu signaling connection identifierID allocated by the RNC for this the MBMS service, allocates allocating the identifier of the signaling connection in the SGSN, and constructs constructing a Signaling Connection Control Part (SCCP) a SCCP Connection Confirmation message and a an MBMS Radio Access Bearer (RAB) Assignment Request message;

(c) SGSN sends sending, by the SGSN, a the SCCP Connection Confirmation message to the RNC; and

(d) SGSN sends sending, by the SGSN, a the MBMS RAB Assignment Request message to the RNC via the a shared Iu signaling connection established, if the MBMS RAB Assignment Request message is included in the data field of the SCCP Connection Confirmation message, this step can be omitted.

11. The method as claimed in Claim 10, wherein further comprising: ifwhen a certain UE has relocated or needs to receive other a non-MBMS service besides MBMS service or it has moved, RNC needs to, the RNC establish establishes a dedicated Iu signaling connection for the UE, which includes by performing the following steps:

(a) after determining to execute a relocation procedure, constructing SRNC decides to execute a relocation procedure;

(b) SRNC constructs a Relocation Demand message and checks checking whether there is a an Iu signaling connection for this the UE; and if it is absentthere is no Iu signaling connection for the UE, constructing a an SCCP Connection Request message, which includes a Relocation Demand message in its data field, is constructed;

(eb) sending SRNC sends a the SCCP Connection Request message to the SGSN, requests requesting to establish a an SCCP signaling connection, and then waits for a reply; and

(dc) receiving SRNC receives anthe SCCP Connection Confirmation message from the SGSN, which indicates the success ofthat the shared Iu signaling connection has been successfully establishment established used for this the MBMS service.

12. The method as claimed in Claim 10, wherein ~~further comprising: if~~when a ~~certain~~ UE has relocated or needs to receive ~~other~~ a non-MBMS service ~~besides MBMS service or it has moved~~, the SGSN ~~needs to establish~~ establishes a dedicated Iu signaling connection for the UE ~~, which includes~~ by performing the following steps:

(a) after receiving ~~a~~ the SCCP Connection Request message from the RNC, ~~SGSN separates~~ separating the RANAP message included in the data fields from the SCCP Connection Request message, and ~~if~~ when the RANAP message is a Relocation Demand message, ~~it saves~~ saving the Iu signaling connection ~~ID~~ identifier ~~allocated by RNC for this service~~, ~~allocates~~ allocating the identifier of the signaling connection in SGSN, and ~~constructs~~ constructing ~~a~~ the SCCP Connection Confirmation message;

(b) ~~SGSN sends~~ sending the SCCP Connection Confirmation message to the RNC;

(c) ~~SGSN sends~~ sending a Relocation Request message to the new SGSN; and

(d) ~~After~~ after receiving a Relocation Response message from the new SGSN, ~~SGSN sends~~ sending a Relocation Command message to the RNC via the dedicated Iu signaling connection for the UE.

13. The method as claimed in Claim 10, wherein ~~further comprising: if~~when a ~~certain~~ UE has relocated or needs to receive ~~other~~ a non-MBMS service ~~besides MBMS service or it has moved~~, the RNC ~~needs to establish~~ establishes a dedicated Iu signaling connection for the UE ~~, which includes~~ by performing the following ~~steps~~:

~~(a)~~ determining, when the RNC receives a non-~~MAC MBMS message~~ non Media Access Control (non-MAC) Service Request message from the UE, ~~it examines~~ whether there is a dedicated Iu signaling connection for the UE, and if there is no dedicated Iu signaling connection for the UE ~~it is absent~~, ~~the RNC constructs~~ constructing ~~a~~ an SCCP Connection Request message, ~~initiates~~ initiating ~~a~~ an SCCP connection establishment procedure while forwarding the Service Request message to the SGSN, ~~RNC sends~~ and sending the SCCP Connection Request message to the SGSN ~~and then waits for a reply;~~,

~~(b)~~wherein the dedicated Iu signaling connection for the UE has been successfully established ~~if~~when the RNC receives ~~a~~ the SCCP Connection Confirmation message from the SGSN~~, it indicates that the dedicated Iu signaling connection for this UE has been successfully established~~.

14. The method as claimed in Claim 10, wherein ~~further comprising: if~~when a ~~certain~~ UE has relocated or needs to receive ~~other~~ a non-MBMS service ~~besides MBMS service or it has moved~~, the SGSN ~~needs to establish~~ establishes a dedicated Iu signaling connection for the UE~~, which includes~~ by performing the following steps:

(a) separating, after receiving ~~a~~ the SCCP Connection Request message from the RNC, ~~SGSN separates~~ the RANAP message included in the data fields from the SCCP Connection Request message, ~~if~~ and when the RANAP message is a Service Request message, ~~it saves~~ saving the Iu signaling connection ~~ID~~ identifier ~~allocated by RNC for this service~~, ~~allocates~~ allocating the identifier of the signaling connection in the SGSN, and ~~constructs~~ constructing ~~a~~ the SCCP Connection Confirmation message;

(b) ~~SGSN)~~ ~~sends~~ sending ~~a~~ the SCCP Connection Confirmation message to the RNC; and

(c) returning, if the service request is accepted, ~~the SGSN returns back~~ a Service Acceptance message to ~~MS~~ the UE and ~~sends~~ sending ~~a~~ an Establish RAB message via ~~this~~ the dedicated Iu signaling connection.

15. The method as claimed in Claim 10, wherein~~, in the SRNS relocation flow,~~ if ~~the~~ a target RNC is not incorporated with ~~a certain~~ an MBMS service necessary for the UE after the UE ~~receiving~~ receives a Relocation Request message, ~~it~~ the target RNC sends ~~a~~ an MBMS Service Request message to the SGSN~~, thus, During the next step (607, 707, 807), the RAB establishment procedure can also~~ to establish the RAB for the MBMS service.

16. The method as claimed in Claim 10, wherein the RNC initiates an Iu connection release procedure for the shared MBMS Iu signaling connection, when there is no UE using ~~a certain~~ an MBMS service between the RNC and the SGSN~~, RNC can initiate a Iu connection release procedure~~.

17. The method as claimed in Claim 10, wherein the SGSN initiates a release procedure for the shared MBMS Iu signaling connection, ~~SGSN can initiate a release procedure in the following two situations:~~

when the SGSN ~~won't~~no longer ~~receive~~receives MBMS data ~~any more, a signaling connection and RAB release procedure can be initiated;~~ and

when ~~no UE uses a certain~~an MBMS service between the RNC and the SGSN~~, SGSN can initiate an Iu connection release procedure~~ is not used by a UE.

18. A method of sharing a signaling bearer connection on an Iu interface for a Multimedia Broadcast Multicast Service (MBMS), where a Service General Packet Radio Service (GPRS) Supporting Node (SGSN) ~~MBMS service, in which SGSN~~ establishes ~~the~~a shared signaling bearer for the MBMS service on the Iu interface, the method~~,~~ comprising the steps of:

(a) receiving, by the SGSN,~~receives~~ MBMS data from a Gateway General Packet Radio Service (GPRS) Supporting Node (GGSN)~~GGSN~~;

(b) analyzing, by the SGSN,~~analyzes~~ the ~~on-going~~MBMS service, ~~if there is no shared Iu connection used for this service, it~~and ~~organizes~~organizing a Signaling Connection Control Part (SCCP)~~SCCP~~ Connection Request message including,~~which include a~~an MBMS Radio Access Bearer (RAB) Assignment Request message in its data field if there is no shared Iu signaling connection used for this service;

(c) sending, by the SGSN, an~~the sends a~~ SCCP Connection Request message to a Radio Network Controller (RNC), ~~requests~~requesting to establish an SCCP signaling connection~~, and then waits for a reply~~; and

(d) ~~SGSN receives~~receiving, by the SGSN, a~~an~~ SCCP Connection Confirmation message from the RNC, which indicates that the shared Iu signaling connection has been successfully established for the MBMS service~~which indicates the success of the shared Iu signaling connection establishment for this service~~.

19. The method as claimed in Claim 18, wherein ~~the following situation is added to the conditions of the existing SCCP connection establishment initiated by SGSN:~~ step (c) further comprises sending, ~~when~~by the SGSN,~~sends a~~the MBMS RAB Assignment

Request message, ~~and~~ and if there is no Iu signaling connection corresponding to ~~this~~ the MBMS service, ~~the SGSN initiates~~ initiating, by the SGSN, ~~a~~ an SCCP connection establishment procedure, wherein a Radio Access Network Application Part (RANAP)~~RANAP~~ message is included in the data field of the SCCP Connection Request message.

20. The method as claimed in Claim 18, wherein ~~further comprising: if~~ when a ~~certain~~ UE has relocated or needs to receive ~~other~~ a non-MBMS service ~~besides MBMS service or it has moved~~, the RNC ~~needs to establish~~ establishes a dedicated Iu signaling connection for the UE~~, which includes~~ by performing the following steps:

(a) ~~SRNC decides~~ after determining to execute a relocation procedure~~;~~

~~(b) SRNC,~~ constructing ~~constructs~~ a Relocation Demand message and ~~examines~~ determining whether there is ~~a~~ an Iu signaling connection for ~~this~~ the UE~~;~~, and if ~~it is absent~~ there is no Iu signaling connection for the UE, constructing ~~a~~ the SCCP Connection Request message, which includes a Relocation Demand message in its data field~~, is constructed~~;

(~~c~~b) ~~SRNC sends~~ sending ~~a~~ the SCCP Connection Request message to the SGSN, requesting to ~~requests to establish~~ establish ~~a~~ the SCCP signaling connection~~, and then waits for a reply~~; and

(~~d~~c) ~~SRNC receives~~ receiving ~~a~~ the SCCP Connection Confirmation message from the SGSN, which indicates that the shared Iu signaling connection has been successfully established for the MBMS service~~which indicates the success of the shared Iu signaling connection establishment used for this service~~.

21. The method as claimed in Claim 18, wherein ~~further comprising: if~~when a ~~certain~~UE has relocated or needs to receive ~~other~~a non-MBMS service~~besides MBMS service or it has moved~~, the SGSN ~~needs to establish~~establishes a dedicated Iu signaling connection for the UE~~, which includes~~ by performing the following steps:

after receiving the ~~[[a]]~~SCCP Connection Request message from RNC, ~~SGSN separates~~ separating ~~the~~a Radio Access Network Application Part (RANAP)~~RANAP~~ message included in the data field from the SCCP Connection Request ~~messages~~, and if the RANAP message is a Relocation Demand message, ~~it saves~~saving the Iu signaling connection identifier ~~ID~~ allocated by the RNC for ~~this~~the MBMS service, ~~allocates~~ allocating the identifier of the signaling connection in the SGSN, and ~~constructs~~ constructing ~~a~~the SCCP Connection Confirmation message;

~~SGSN sends~~sending ~~a~~the SCCP Connection Confirmation message to the RNC;

~~SGSN sends~~sending a Relocation Request message to ~~the~~a new SGSN; and

after receiving a Relocation Response message from the new SGSN, ~~SGSN sends~~ sending a Relocation Command message to the RNC via the dedicated Iu signaling connection for the UE.

22. The method as claimed in Claim 18, wherein ~~further comprising: if~~when a ~~certain~~UE has relocated or needs to receive ~~other~~a non-MBMS service~~besides MBMS service or it has moved~~, the RNC ~~needs to establish~~establishes a dedicated Iu signaling connection for the UE~~, which includes~~ by performing the following~~steps~~:

~~(a) when RNC receives~~receiving a non Media Access Control (non-MAC) ~~message~~ Service Request message from the UE~~,~~ and ~~it checks~~checking whether there is a dedicated Iu signaling connection for the UE, and if ~~it is absent~~there is no dedicated Iu signaling connection for the UE, ~~RNC constructs~~constructing ~~a~~the SCCP Connection Request message and ~~initiates~~initiating ~~a~~an SCCP connection establishment procedure while forwarding the Service Request message to the SGSN, and ~~RNC sends~~sending the SCCP Connection Request message to the SGSN~~and then waits for a reply;~~, wherein the dedicated Iu signaling connection for the UE has been successfully established when the

— (b) if RNC receives a the SCCP Connection Confirmation message from the SGSN, it indicates that the dedicated Iu signaling connection for this UE has been successfully established.

23. The method as claimed in Claim 18, wherein further comprising: if when a certain UE has relocated or needs to receive other a non-MBMS service besides MBMS service or it has moved, the SGSN needs to establish establishes a dedicated Iu signaling connection for the UE, which includes by performing the following steps:

(a) after receiving a the SCCP Connection Request message from the RNC, SGSN separates separating the Radio Access Network Application Part (RANAP)RANAP message included in the data fields field from the SCCP Connection Request message, and if when the RANAP message is a Service Request message, it saves saving the Iu signaling connection identifierID allocated by the RNC for this the MBMS service, allocates allocating the identifier of the signaling connection in the SGSN, and constructs constructing a the SCCP Connection Confirmation message;

— (b) SGSN and sends sending the SCCP Connection Confirmation message to the RNC;, wherein the SGSN returns a Service Acceptance message to the UE and sends an Establish RAB message via the dedicated connection, when

— (c) if the service request is accepted, the SGSN returns back a Service Acceptance message to MS and sends a Establish RAB message via this dedicated connection.

24. The method as claimed in Claim 18, wherein for the shared MBMS Iu signaling connection, when there is no UE using a certainan MBMS service between the RNC and the SGSN, the RNC can initiate initiates a an Iu connection release procedure.

25. The method as claimed in Claim 18, wherein for the shared MBMS Iu signaling connection, the SGSN can initiate initiates a release procedure in the following two situations:

— when the SGSN no longer receives MBMS data, and when an MBMS service between the RNC and the SGSN is not used by a UEwhen SGSN won't receive MBMS data any more, a signaling connection and RAB release procedure can be initiated;

~~when no UE uses a certain MBMS service between RNC and SGSN, SGSN can initiate a Iu connection release procedure.~~

26. A method of <u>sharing a</u> signaling bearer connection <u>established by a Radio Network Controller (RNC) on</u> <u>an</u> Iu interface for <u>a Multimedia Broadcast Multicast Service (MBMS)</u>~~MBMS~~ service, ~~wherein RNC establishes the shared signaling bearer for MBMS service on Iu interface, includes the following steps~~<u>the method comprising</u>:

    (a) — ~~(a)~~ after receiving <u>a Signaling Connection Control Part (SCCP)</u> ~~a SCCP~~ Connection Request message from <u>a Service General Packet Radio Service (GPRS) Supporting Node (SGSN)</u>~~SGSN~~, ~~RNC separates~~<u>separating, by the RNC,</u> ~~the~~<u>a</u> Radio Access Network Application Part (RANAP)~~RANAP~~ message included in the data fields <u>of the SCCP Connection Request message</u> and ~~saves~~<u>saving the</u>~~the~~<u>an</u> Iu signaling connection ~~ID~~<u>identifier</u> allocated by SGSN for ~~this~~<u>the MBMS</u> service;

    (b) ~~and allocates~~<u>allocating</u> the identifier of the signaling connection in <u>the</u> RNC and ~~constructs~~<u>constructing</u> ~~a~~<u>an</u> SCCP Connection Confirmation message and ~~a~~<u>an</u> MBMS <u>Radio Access Bearer (RAB)</u> Assignment Response message;

    (~~b~~<u>c</u>) ~~RNC sends~~<u>sending, by the RNC,</u> ~~a~~<u>the</u> SCCP Connection Confirmation message to <u>the</u> SGSN; <u>and</u>

    (~~c~~<u>d</u>) ~~RNC sends~~<u>sending, by the RNC,</u> ~~a~~<u>the</u> MBMS RAB Assignment Response message to <u>the</u> SGSN via ~~the~~<u>a</u> shared Iu <u>signaling</u> connection ~~established, if the MBMS RAB Assignment Response message is included in the data field of the SCCP Connection Confirmation message, this step can be omitted~~.

27. The method as claimed in Claim 26, wherein ~~further comprising: if~~<u>when</u> a ~~certain~~ UE <u>has relocated or</u> needs to receive ~~other~~<u>a</u> non-MBMS service ~~besides MBMS service or it has moved~~, <u>the</u> RNC ~~needs to establish~~<u>establishes</u> a dedicated Iu <u>signaling</u> connection for the UE~~, which includes~~<u>by performing</u> the following steps:

    (a) ~~SRNC decides~~<u>determining</u> to execute a relocation procedure;

    (b) ~~SRNC constructs~~<u>constructing</u> a Relocation Demand message and ~~checks~~<u>checking</u> whether there is ~~a~~<u>an</u> Iu signaling connection for ~~this~~<u>the</u> UE~~;~~<u>, and if</u> ~~it is absent~~<u>there is</u>

no Iu signaling connection for the UE, constructing ~~the~~a SCCP Connection Request message, which includes a Relocation Demand message in its data field~~, is constructed~~;

(c) ~~SRNC sends~~sending ~~the~~a SCCP Connection Request message to the SGSN, ~~requests~~requesting to establish ~~a~~the SCCP signaling connection~~ and then waits for a reply~~; and

(d) ~~SRNC receives~~receiving ~~a~~the SCCP Connection Confirmation message from the SGSN, which indicates that the shared Iu signaling connection has been successfully established for the MBMS service~~which indicates the success of the shared Iu signaling connection establishment used for this service~~.

28. The method as claimed in Claim 26, wherein ~~further comprising: if~~when a ~~certain~~UE has relocated or needs to receive ~~other~~a non-MBMS service~~ besides MBMS service or it has moved~~, the SGSN ~~needs to establish~~establishes a dedicated Iu signaling connection for the UE~~, which includes~~ by performing the following steps:

(a) after receiving ~~a~~the SCCP Connection Request message from the RNC, ~~SGSN~~ ~~separates~~separating the RANAP message included in the data ~~fields~~field from the SCCP Connection Request message, ~~if~~and when the RANAP message is a Relocation Demand message, ~~it saves~~saving the Iu signaling connection ~~ID~~identifier allocated by the RNC for ~~this~~the MBMS service, ~~allocates~~allocating the identifier of the signaling connection in the SGSN, and ~~constructs~~constructing ~~a~~the SCCP Connection Confirmation message;

(b) ~~SGSN sends~~sending ~~a~~the SCCP Connection Confirmation message to the RNC;

(c) ~~SGSN sends~~sending a Relocation Request message to ~~the~~a new SGSN; and

(d) after receiving a Relocation Response message from the new SGSN, ~~SGSN sends~~ sending a Relocation Command message to the RNC via the dedicated Iu signaling connection for the UE.

29. The method as claimed in Claim 28, wherein ~~the following situation is added to the conditions of the existing SCCP connection establishment initiated by RNC:~~ when the RNC sends ~~a~~an MBMS Service Demand message, if there is no corresponding Iu signaling connection for ~~this~~the MBMS service, the RNC initiates ~~a~~an SCCP connection

establishment procedure, a wherein the RANAP message is included in the data field of the SCCP Connection Request message.

30. The method as claimed in Claim 26, wherein ~~further comprising: if~~when a ~~certain~~ UE has relocated or needs to receive ~~other a~~ non-MBMS service ~~besides MBMS service or it has moved~~, the RNC ~~needs to establish~~ establishes a dedicated Iu signaling connection for the UE, ~~which includes~~ by performing the following ~~steps~~:

~~(a)~~ determining, when RNC receives a non Media Access Control (non-MAC) ~~message~~ Service Request message from the UE, ~~it examines~~ whether there is a dedicated Iu signaling connection for the UE, and if ~~it is absent~~ there is no dedicated Iu signaling connection for the UE, ~~the RNC constructs~~ constructing ~~a~~ the SCCP Connection Request message and ~~initiates~~ initiating ~~a~~ an SCCP connection establishment procedure while forwarding the Service Request message to the SGSN, and ~~RNC sends~~ sending the SCCP Connection Request message to the SGSN ~~and then waits for a reply;~~

~~(b) if RNC receives a SCCP Connection Confirmation message from SGSN, it indicates that the dedicated Iu signaling connection for this UE has been successfully established,~~

wherein the dedicated Iu signaling connection for the UE has been successfully established when the RNC receives the SCCP Connection Confirmation message from the SGSN.

31. The method as claimed in Claim 26, wherein ~~further comprising: if~~when a ~~certain~~ UE has relocated or needs to receive ~~other a~~ non-MBMS service ~~besides MBMS service or it has moved~~, the SGSN ~~needs to establish~~ establishes a dedicated Iu signaling connection for the UE, ~~which includes~~ by performing the following ~~steps~~:

~~(a)~~ after receiving ~~a~~ the SCCP Connection Request message from the RNC, ~~SGSN~~ ~~separates~~ separating the RANAP message included in the data ~~fields~~ field from the SCCP Connection Request message, and ~~when~~ if the RANAP message is a Relocation Request message, ~~it saves~~ saving the Iu signaling connection ~~ID~~ identifier allocated by the RNC for ~~this~~ the MBMS service, ~~allocates~~ allocating the identifier of the signaling connection

in the SGSN, and ~~constructs~~ constructing ~~a~~ the SCCP Connection Confirmation message; and

~~(b) SGSN sends~~ sending ~~a~~ the SCCP Connection Confirmation message to the RNC~~;~~

~~(c)If the service request is accepted,~~ wherein the SGSN returns ~~back a~~ a Service Acceptance message to ~~MS~~ the UE and sends ~~a~~ an Establish RAB message via ~~this~~ the dedicated Iu signaling connection.

32. The method as claimed in Claim 27, wherein ~~in SRNS relocation flow,~~ if the ~~source~~ RNC ~~finds~~ determines that ~~the moving~~ a user of the UE is ~~the~~ a last user for ~~a~~ ~~certain~~ an MBMS service between the ~~source~~ RNC and the ~~source~~ SGSN and that the shared Iu signaling connection for ~~this~~ the MBMS service also exists, the ~~source~~ RNC initiates a procedure of releasing the shared Iu signaling connection and ~~the~~ resources on ~~the~~ a user plane.

33. The method as claimed in Claim 32, wherein the release procedure ~~is composed by the following three steps~~ includes:

~~RNC sends~~ sending, by the RNC, ~~a~~ an Iu Release Request message to the SGSN ~~and~~ to requests ~~to~~ a release of the shared Iu signaling connection and the resources on the user plane;

sending, by the SGSN, an Iu Release Command message to the RNC, after receiving ~~a~~ the Iu Release Request message from the RNC~~, SGSN sends a Iu Release Command message to the source RNC;~~; and

releasing, by the RNC, the corresponding resources and sending an Iu Release Completion message to the SGSN, after receiving the Iu Release Command message from the SGSN~~, the source RNC releases the corresponding resources and sends a Iu Release Completion message to SGSN;~~,

~~if~~ wherein the release procedure is executed a plurality of times when the UE is the last user of multiple services in the ~~source~~ RNC~~, the release procedure needs to be executed for multiple times;~~

~~this release scheme is also applicable to the situation when the last UE that uses a certain MBMS service between RNC and SGSN quits the service.~~

34. The method as claimed in Claim 32, wherein the release procedure is initiated by the RNC, ~~if~~ when the ~~source~~ RNC ~~finds~~ determines that the last UE that uses the MBMS service has ~~left or quitted~~ left the service, and the RNC releases the user plane resources and Iu signaling connection, and ~~then~~ sends ~~a~~ an MBMS Iu Release Indication message to ~~the old~~ the previous SGSN~~, if the UE is the last user of multiple services in the source RNC, the release procedure needs to be executed for multiple times~~.

35. The method as claimed in Claim 34, wherein the MBMS Iu Release Indication message is a connection-oriented message, and the message includes an RAB~~[s]~~ Data Volume Report List and a released RABs list.

36. The method as claimed in Claim 27, wherein ~~in the SRNS relocation flow,~~ ~~if~~ when the SGSN ~~finds~~ determines that the last UE that uses the MBMS service between ~~it~~ the SGSN and the RNC has left ~~or quitted~~ the service and ~~there still exists~~ a shared Iu signaling connection still exists for ~~this~~ the MBMS service, the SGSN initiates a release procedure of the shared Iu signaling connection, the ~~:~~
SGSN re-sends ~~a~~ an Iu Release Command message to the RNC and requests to release the shared Iu signaling connection and ~~the~~ resources on [[the]]a user plane~~;~~, and
after receiving the Iu Release Command message, the ~~source~~ RNC releases the corresponding resources and sends ~~a~~ an Iu Release ~~completion~~ Completion message to SGSN;
wherein the release procedure is executed a plurality of times when the UE is the last user of multiple services in the RNC~~if the UE is the last user of multiple services in the source RNC, the release procedure needs to be executed for several times~~.

37. The method as claimed in Claim 26, wherein for the shared MBMS Iu signaling connection, when there is no UE using ~~a certain~~ the MBMS service between the RNC and the SGSN, the RNC ~~can initiate~~ initiates ~~a~~ an Iu connection release procedure.

38. The method as claimed in Claim 26, wherein for the shared MBMS Iu signaling connection, the SGSN ~~can initiate~~ initiates a release procedure ~~in the following two situations:~~

when the SGSN no longer receives MBMS data, and when an MBMS service between the RNC and the SGSN is not used by a UE~~when SGSN won't receive MBMS data any more, a signaling connection and RAB release procedure can be initiated;~~

~~when no UE uses a certain MBMS service between RNC and SGSN, both RNC and SGSN initiates an Iu connection release procedure.~~